



Attorney Docket: 061069-0305769

Client Reference: SPO-2550

CGC

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Re PATENT No. 6,801,347 B2 to NAKAMURA ET AL. Confirmation Number: 4671

Application No.: 10/674,489

Group Art Unit: 2872

Filed: October 1, 2003

Examiner: Fayez Assaf

Title: OBSERVATION OPTICAL SYSTEM USING VOLUME HOLOGRAM

REQUEST FOR CERTIFICATE OF CORRECTION  
UNDER 37 C.F.R. § 1.322

U.S. Patent and Trademark Office  
Customer Window – Certificate of Correction Branch  
Randolph Building  
Alexandria, VA 22314

Certificate  
JUN 06 2005  
of Correction

Sir:

In reviewing the above-referenced patent grant, Applicant noted that text that should have been deleted by the Examiner's Amendment dated April 2, 2004 was, in fact, printed in the patent. The text in question appears in claim 3, column 33, lines 35-55, and in claim 4, column 34, lines 46-51 and was bracketed for deletion by Examiner Assef. In support of this request, enclosed are a copy of pages 1-6 of the Notice of Allowability dated April 2, 2004, which contains the portion of the Examiner's Amendment in question, and a copy of columns 33 and 34 from U.S. Patent No. 6,801,347.

It is respectfully requested that a Certificate of Correction be issued to correct these errors. Two PTO-1050 forms are attached to this request. As these errors the fault of the Patent Office, Applicant does not believe that a fee is required.

Respectfully submitted,

PILLSBURY WINTHROP SHAW  
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Enclosures

Date: May 27, 2005  
P.O. Box 10500  
McLean, VA 22102

JUN 09 2005

UNITED STATES PATENT AND TRADEMARK OFFICE  
CERTIFICATE OF CORRECTIONPATENT NO : 6801347 *B2*

DATED : October 5, 2004

INVENTOR(S) : TOHRU NAKAMURA, ET AL.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In claim 3, Col. 33, lines 35 through 55, delete bracketed tex.

In claim 4, Col. 34, lines 46 through 51, delete bracketed text.

MAILING ADDRESS OF SENDER:  
PILLSBURY WINTHROP SHAW PITTMAN LLP  
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PATENT NO. 6801347 *B2*

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This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

JUN 09 2005

UNITED STATES PATENT AND TRADEMARK OFFICE  
CERTIFICATE OF CORRECTIONPATENT NO : 6801347 *B2*

DATED : October 5, 2004

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In claim 3, Col. 33, lines 35 through 55, delete bracketed tex.

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JUN 09 2005



MAY 27 2005

Notice of Allowability	Application No.	Applicant(s)
	10/674,489	NAKAMURA ET AL.
	Examiner Fayez G. Assaf	Art Unit 2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTO-85) or other appropriate communication will be mailed in due course. THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS. This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1.  This communication is responsive to the Divisional Application filed 10/1/03.

2.  The allowed claim(s) is/are 19-33,35 and 37-39.

3.  The drawings filed on 01 October 2003 are accepted by the Examiner.

4.  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)  All b)  Some\* c)  None of the:

1.  Certified copies of the priority documents have been received.

2.  Certified copies of the priority documents have been received in Application No. 09/749,569.

3.  Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5.  A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6.  CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.

(a)  including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached  
1)  hereto or 2)  to Paper No./Mail Date \_\_\_\_\_.

(b)  including changes required by the attached Examiner's Amendment / Comment or in the Office action of  
Paper No./Mail Date \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7.  DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

#### Attachment(s)

1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	6. <input type="checkbox"/> Interview Summary (PTO-413), Paper No./Mail Date _____.
3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date <u>10/01/03</u>	7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment
4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material	8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance
	9. <input type="checkbox"/> Other _____.



**DETAILED ACTION**

***Examiner's Amendment***

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Henry J. Daley (Reg. No. 42459) on 3/19/2004.

Claims 21 and 22 have been amended to correct typographical errors.

Claim 33 has been amended in order to distinguish over the prior art.

- Claims 37-39 have been amended in order to provide proper claim dependency.

The claims have been amended as follows:

Claims 34 and 36 have been cancelled.

21. (Currently Amended) An image observation optical system comprising:

Art Unit: 2872

an image display element; and

an eyepiece optical system which introduces an image displayed by said image display element to a center of an eye of an observer without forming an intermediate image, so as to allow the observer to observe said image as a virtual image,

wherein said eyepiece optical system is constructed and arranged to bend an optical axis using reflecting surfaces so as to be compact, said optical axis lying in a plane,

wherein said eyepiece optical system is symmetrically formed with respect to said plane and includes an optical element having an entrance surface, a plurality of curved reflecting surfaces and an exit surface, at least one of said reflecting surfaces being provided with a volume hologram (HOE),

[wherein said eyepiece optical system comprises a prism with a positive refracting power, and, upon an image position F0 at a midpoint, an image position Fb at one end point showing a larger chromatic aberration of magnification, and an image position Fa at another end point showing a smaller chromatic aberration of magnification being defined on a segment that is an intersection formed by said plane of symmetry of said eyepiece optical system and an image display surface, said image

Art Unit: 2872

observation optical system satisfies the following conditions simultaneously:

$$-1 < \phi_y(HOE, Fa) / \phi_y(Total) < 2$$

$$-1 < \phi_y(HOE, Fb) / \phi_y(Total) < 1$$

where  $\phi_y(HOE, Fa)$  is a y-direction power of said HOE at the image position Fa,  $\phi_y(HOE, Fb)$  is a y-direction power of said HOE at the image position Fb, and  $\phi_y(Total)$  is a y-direction power of an entire system, ]

wherein said eyepiece optical system is configured as a prism optical system having at least two reflecting surfaces, said HOE has one or two plane of symmetry of power, and said plane of symmetry of said HOE coincides with a plane of symmetry of a shape of a base on which said HOE is provided, and

wherein said prism optical system comprises a prism with a positive refracting power and at least two HOEs between said image display element and an exit pupil, and, upon an image position F0 at a midpoint being defined on a segment that is an intersection displayed by said plane of symmetry of said eyepiece optical system and an image display surface, said image observation optical system satisfies the following condition:

$$|\phi_y(\text{HOE, F0})/\phi_y(\text{Total})| < 0.25$$

where  $\phi_y(\text{HOE, F0})$  is a y-direction power of said HOEs at the image position F0, and  $\phi_y(\text{Total})$  is a y-direction power of an entire system.

22. (Currently Amended) An image observation optical system comprising:

an image display element; and

an eyepiece optical system which introduces an image displayed by said image display element to a center of an eye of an observer without forming an intermediate image, so as to allow the observer to observe said image as a virtual image,

wherein said eyepiece optical system is constructed and arranged to bend an optical axis using reflecting surfaces so as to be compact, said optical axis lying in a plane,

wherein said eyepiece optical system is symmetrically formed with respect to said plane and includes an optical element having an entrance surface, a plurality of curved reflecting surfaces and an exit surface, at least one of said reflecting surfaces being provided with a volume hologram (HOE),

Art Unit: 2872

wherein said eyepiece optical system comprises a prism with a positive refracting power, and, upon an image position F0 at a midpoint, an image position Fb at one end point showing a larger chromatic aberration of magnification, and an image position Fa at another end point showing a smaller chromatic aberration of magnification being defined on a segment that is an intersection formed by said plane of symmetry of said eyepiece optical system and an image display surface, said image observation optical system satisfies the following conditions simultaneously:

$$-1 < \phi_y(HOE, Fa) / \phi_y(Total) < 2$$

$$-1 < \phi_y(HOE, Fb) / \phi_y(Total) < 1$$

where  $\phi_y(HOE, Fa)$  is a y-direction power of said HOE at the image position Fa,  $\phi_y(HOE, Fb)$  is a y-direction power of said HOE at the image position Fb, and  $\phi_y(Total)$  is a y-direction power of an entire system,

[wherein said eyepiece optical system is configured as a prism optical system having at least two reflecting surfaces, said HOE has one or two plane of symmetry of power, and said plane of symmetry of said HOE coincides with a plane of symmetry of a shape of a base on which said HOE is provided,]

## 33

where  $\phi_y(HOE, Fa)$  is a y-direction power of said HOE at the image position  $Fa$ ,  $\phi_y(HOE, Fb)$  is a y-direction power of said HOE at the image position  $Fb$ , and  $\phi_y(Total)$  is a y-direction power of an entire system, and

wherein said eyepiece optical system comprises at least two HOEs between said image display element and an exit pupil, and said image observation optical system satisfies the following condition:

$$|\phi_y(HOE, F0)/\phi_y(Total)| \leq 0.25$$

where  $\phi_y(HOE, F0)$  is a y-direction power of said HOEs at the image position  $F0$ , and  $\phi_y(Total)$  is a y-direction power of an entire system.

3. An image observation optical system comprising: an image display element; and an eyepiece optical system which introduces an image displayed by said image display element to a center of an eye of an observer without forming an intermediate image, so as to allow the observer to observe said image as a virtual image,

wherein said eyepiece optical system is constructed and arranged to bend an optical axis using reflecting surfaces so as to be compact, said optical axis lying in a plane,

wherein said eyepiece optical system is symmetrically formed with respect to said plane and includes an optical element having an entrance surface, a plurality of curved reflecting surfaces and an exit surface, at least one of said reflecting surfaces being provided with a volume hologram (HOE),

~~wherein said eyepiece optical system comprises a prism with a positive refracting power, and, upon an image position  $F0$  at a midpoint, an image position  $Fb$  at one end point showing a larger chromatic aberration of magnification, and an image position  $Fa$  at another end point showing a smaller chromatic aberration of magnification being defined on a segment that is an intersection formed by said plane of symmetry of said eyepiece optical system and an image display surface, said image observation optical system satisfies the following conditions simultaneously:~~

$$-1 < \phi_y(HOE, Fa)/\phi_y(Total) < 2$$

$$-1 < \phi_y(HOE, Fb)/\phi_y(Total) < 1$$

where  $\phi_y(HOE, Fa)$  is a y-direction power of said HOE at the image position  $Fa$ ,  $\phi_y(HOE, Fb)$  is a y-direction power of said HOE at the image position  $Fb$ , and  $\phi_y(Total)$  is a y-direction power of an entire system,

wherein said eyepiece optical system is configured as a prism optical system having at least two reflecting surfaces, said HOE has one or two plane of symmetry of power, and said plane of symmetry of said HOE coincides with a plane of symmetry of a shape of a base on which said HOE is provided, and

wherein said prism optical system comprises a prism with a positive refracting power and at least two HOEs between said image display element and an exit pupil, and, upon an image position  $F0$  at a midpoint being defined on a segment that is an intersection displayed by said plane of symmetry of said eyepiece optical

## 34

system and an image display surface, said image observation optical system satisfies the following condition:

$$|\phi_y(HOE, F0)/\phi_y(Total)| \leq 0.25$$

where  $\phi_y(HOE, F0)$  is a y-direction power of said HOEs at the image position  $F0$ , and  $\phi_y(Total)$  is a y-direction power of an entire system.

4. An image observation optical system comprising: an image display element; and

an eyepiece optical system which introduces an image displayed by said image display element to a center of an eye of an observer without forming an intermediate image, so as to allow the observer to observe said image as a virtual image,

wherein said eyepiece optical system is constructed and arranged to bend an optical axis using reflecting surfaces so as to be compact, said optical axis lying in a plane,

wherein said eyepiece optical system is symmetrically formed with respect to said plane and includes an optical element having an entrance surface, a plurality of curved reflecting surfaces and an exit surface, at least one of said reflecting surfaces being provided with a volume hologram (HOE),

wherein said eyepiece optical system comprises a prism with a positive refracting power, and, upon an image position  $F0$  at a midpoint, an image position  $Fb$  at one end point showing a larger chromatic aberration of magnification, and an image position  $Fa$  at another end point showing a smaller chromatic aberration of magnification being defined on a segment that is an intersection formed by said plane of symmetry of said eyepiece optical system and an image display surface, said image observation optical system satisfies the following conditions simultaneously:

$$-1 < \phi_y(HOE, Fa)/\phi_y(Total) < 2$$

$$-1 < \phi_y(HOE, Fb)/\phi_y(Total) < 1$$

where  $\phi_y(HOE, Fa)$  is a y-direction power of said HOE at the image position  $Fa$ ,  $\phi_y(HOE, Fb)$  is a y-direction power of said HOE at the image position  $Fb$ , and  $\phi_y(Total)$  is a y-direction power of an entire system,

~~wherein said eyepiece optical system is configured as a prism optical system having at least two reflecting surfaces, said HOE has one or two plane of symmetry of power, and said plane of symmetry of said HOE coincides with a plane of symmetry of a shape of a base on which said HOE is provided,~~

wherein said eyepiece optical system is configured as a prism optical system having at least two reflecting surfaces, said HOE has one or two plane of symmetry of power, and said plane of symmetry of said HOE coincides with a plane of symmetry of a shape of a base on which said HOE is provided, and

wherein said eyepiece optical system comprises at least two HOEs between said image display element and an exit pupil, and said image observation optical system satisfies the following condition:

$$|\phi_y(HOE, F0)/\phi_y(Total)| \leq 0.25$$

where  $\phi_y(HOE, F0)$  is a y-direction power of said HOEs at the image position  $F0$ , and  $\phi_y(Total)$  is a y-direction power of an entire system.